

Remarks

Claims 28-31, 33, 34, 36, and 37, 39-42 and 45-57 stand rejected in the application.

Claim 28 has been amended and is the sole remaining independent claim. Claims 30, 31, 34, 42, 45, 52-55 have been amended to more particularly point out and distinctly claim certain aspects of applicants' invention. Claims 29, 56 and 57 have been cancelled.

Reconsideration of the pending application is respectfully requested in view of the following remarks.

1. Double Patenting Objection to Claim 51.

The Office Action states that claim 51 is objected to as being a duplicate of claim 50. Claim 51 has been amended to more particularly point out and distinctly claim an aspect of applicants' invention that is not a duplicate of claim 50.

2. Objection to Claim 53 as Being of Improper Dependent Form.

The Office Action states that the claim limitations of claim 53 are already fully recited in claim 28. Applicants have amended claim 28 to include only the limitation that the ratio of grill width to gap width is "about 80:20," and have amended claim 53 to state that the ratio is limited to a ratio of "about 80:20, with a variance in the ratio of up to 5%." Thus, claim 53 limits the variance otherwise afforded by the term "about" to a variance of 5%..

3. Claim Rejections Under 35 U.S.C. §112.

The Office Action states that claims 50-52 and 56 are rejected under 35 USC § 112, first paragraph, for failing to comply with the written description requirement. Since claim 56 has been cancelled, the following remarks will address only claims 50-52.

As to claim 50, support for the limitation that the enclosure is formed from a non-reflective, opaque material is found in the Specification as filed at paragraph 0012: “Preferably the enclosure is formed from non-reflective, opaque material.”

As to claim 51, support for the limitation that the enclosure is formed from a non-reflective, opaque material is found in the Specification as filed at paragraphs 0010: “The grill may be extruded from non-reflective material;” 0025: “Preferably the optical barrier 12 is formed by a plurality of opaque grills;” and 0031: “Each grill 14 is constructed from stiff non-reflective material.”

As to claim 52, claim 52 recites “... wherein at least one strip of the interlaced image and at least part of first and second adjacent strips of the interlaced image can be viewed by each eye of a viewer through each gap at any time.” Support for the claimed limitation is found in the Specification as filed at paragraph 0033, which describes a preferred embodiment in which “each grill 14 has a width of 20.23 mm and the gap 50 between each grill is 5.08 mm.” Paragraph 0035 recites each set 61 of the interlaced image 21 in preferred embodiments contains “between 10 and 25 strips,” and paragraph 0036 recites: “The width of the set 61 matches the width of one grill 14 plus the gap 50 to an adjacent grill. For the preferred embodiment, this width is 25.4 mm [around 20.23 mm grill plus 5.08mm gap] or 1 inch.”

In view of the above, it can be seen that with the width of one set equaling one grill plus one gap (25.31 mm from paragraph [0033]), each strip in a preferred embodiment may be about 1 mm (25 strips per set) to 2.531 mm (10 strips per set) wide. For the widest (10 strips per set) strips, the width of two adjacent strips is 5.062mm (less than the 5.08mm gap recited at

paragraph 0033). Therefore, the Specification at least inherently discloses embodiments in which “at least part of one strip of the interlaced image and at least part of an adjacent strip of the interlaced image can be viewed by each eye of a viewer through each gap at any time.”

The Office Action also states that claims 28-31, 33, 34, 36, 37, 39-42, 45-55, and 57 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicants regard as the invention. In particular, the Action states that claims 28, 53, and 57 are indefinite for using the term “about;” that claims 28 and 57 are indefinite for not defining the term “variance of up to 5%,” and that claim 55 is indefinite for using the term “other viewing media.” Since claim 57 has been cancelled, the following remarks will address only claims 28, 53, and 55.

As to the use of the term “about” in claims 28 and 53, it is well settled that the term “about” is not indefinite per se, and the Office has offered no rationale other than a statement that the term about is “ambiguous. It is respectfully submitted that the term has its ordinary meaning of approximately, which has consistently been interpreted by the courts not to be indefinite. *See, e.g., Ortho-McNeil Pharmaceutical, Inc. v. Caraco Pharmaceutical Labs, Ltd.*, 476 F.3d 1321 (CAFC 2007).

As to the use of the term “variance of up to 5%” in claim 28, applicants have amended claim 28 to make it more clear that the variance is in the ratio, and not in the individual values that are compared in the ratio. That limitation is supported by the Specification as filed, and particularly at paragraph 0033, where it is stated: “Preferably, there is an 80/20 grill width to spacing 50 ratio, although a variance of up to 5% can be tolerated.” Applicants respectfully

submit that the quoted sentence in paragraph 0033 makes it clear that the 5% relates to the ratio itself (that is, $4 \pm 5\%$, or 3.8-4.2). If the 5% related to the 80 and the 20 (that is $80 \pm 5\%$ and $20 \pm 5\%$) then paragraph 0033 would have recited “although a variances of up to 5% can be tolerated.” Accordingly, and in view of the claim amendment, the amended claim is believed not to be indefinite.

As to the use of the term “other viewing media” in claim 55, paragraph 0030 recites “In the embodiments described above the image is provided on print 21. In alternative embodiments the image may be provided on other viewing media. Such media include rear projection of the image onto a screen or an outdoor television screen.” As suggested by the Specification, persons skilled in the art would appreciate that a wide variety of viewing media may be used to display the image of the present invention, and would not require a complete listing of such alternative viewing media to appreciate the metes and bounds of the claim.

4. Claim Rejections Under 35 U.S.C. §103.

The Office Action states that claims 28-31, 33-37, 42, 43, 46, and 47 are rejected under 35 USC §103 as being unpatentable over U.S. Patent No. 5,966,105 to Gundlach. In particular, the Office states that while Gundlach does not disclose applicants’ claim gap ratio of about 80:20, such a gap ratio was obvious since Gundlach teaches “that the dimension of the grills and gaps are a matter of design choice.”

As background, it should be remembered that the presently claimed apparatus enables a viewer to view an interlaced image (reference number 21 in figure 6A) through an optical barrier (12) having spaced apart grills (14) that define viewing gaps (50) between the grills (14). The

interlaced image (21) comprises adjacent sets of strips from multiple images of different layers (or views) of a subject. Each image forming the interlaced image (21) is divided up into a plurality of adjacent strips, including a first strip, a second strip ... [up to the plurality of strips]. The first strips of the images are arranged adjacently in the interlaced image (21) to form a first set of strips of the interlaced image (21). The second strips of the images are arranged adjacently in the interlaced image (21) to form the second set of strips of the interlaced image (21) adjacent to the first set of strips, and so on for all of the adjacent sets of strips of the interlaced image (21). See paragraphs 0035 – 0037.

With previously proposed lenticular technology, the interlaced image is located behind an array of cylindrical lenticular lenses. A respective one of the lenticular lenses is located in front of each set of strips, with the interlaced image located at the focal distance behind the lenses. The interlaced image is viewed through the lenticular lenses. As described in Gundlach at column 1, lines 55-59: “[O]nly one lineation [or strip] is visible through each lens from any particular viewing angle. Each eye sees different lineations (which represent corresponding distinct views of the original subject) and consequently people looking at the display can construct three dimensional images in their minds.”

Alternatively, with previously proposed raster displays, the lenticular lenses are replaced with a black line (for example) raster. The raster has alternatively clear and opaque parallel lineations, and the interlaced image can be viewed through the clear lineations. The width of each adjacent clear and opaque lineation generally matches the width of one set, and the width of each clear lineation matches the width of each strip. When a viewer moves relative to the raster,

different strips corresponding to a different image can be viewed through the clear lineations. Or as described in Gundlach at column 2, lines 9-12: “This [raster arrangement] enables the interlaced pattern to be viewed through the slits [clear lineations] in the raster so that individual images are visible from different viewing angles. This produces the three dimensional effect.”

In contrast, independent claim 28 defines an apparatus for displaying images having the structural features “a ratio of grill width to gap width being about 80:20 with a variance of up to 5%”, and “at least part of one strip of the interlaced image and at least part of an adjacent strip of the interlaced image can be viewed by each eye of a viewer through each gap at any time, so that the interlaced image in conjunction with the optical barrier display 3D images to the viewer.”

In the claimed apparatus, each eye of the viewer may see part of one strip and part of another strip through each grill at any time, or alternatively one whole strip and parts of two or more other strips through each grill at any time, for example.

Surprisingly, this combination of structural features of (1) the about 80:20 ratio with a variance of up to 5% and (2) each eye always being able to see strips of different layers (or views) making up the interlaced image simultaneously with each eye through each gap, gives the whole viewed image a perceived depth and 3D effect. For example, a billboard sized image up to 6 metres wide can be viewed in 3D from a minimum of five metres to the limit of the viewer’s vision capabilities. The claimed 3D effect is achieved without lenticular elements or other optical elements, and without the viewer having to move relative to a raster whereby different “individual images are visible from different viewing angles” as required by Gundlach (see Gundlach at column 2, lines 11-12).

In addition to the above, applicants respectfully submit that even to the extent that Gundlach teaches that the dimensions of the grills and gaps are a matter of design choice in the context of his invention, in the context of applicants' invention the 80:20 ratio (with a variance of up to 5%) is essential to creating the claimed 3D effect as it displays the optimal amount of each set of the interlaced image through each gap. A grill width to gap width ratio smaller than about 80:20, such as about 70:30, or less, effectively displays more of each set through each gap. A smaller ratio results in a blurred image where the strips are actually perceived as individual strips. That is, the viewer effectively perceives a raw interlaced image without a barrier. On the other hand, a grill width to gap width ratio larger than about 80:20, such as about 90:10, or more, displays less of each set through each gap. A larger ratio results in the image not being perceived in 3D, and ultimately, when the ratio becomes sufficiently large, results in the image not being perceivable through the gaps.

5. Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present application is now in condition for allowance. Favorable reconsideration of the amended application is therefore respectfully requested.

Respectfully submitted,

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